Summary
Steller Sea Lion Recovery Team Meeting
Alaska Fisheries Science Center, Seattle, Washington
15-17 March 2006

Bob Small, Chair of the Steller Sea Lion Recovery Team (SSLRT or RT), opened the meeting at 08:10 on March 15. Small stated the goal for this meeting was to complete any revisions necessary for endorsement of the Recovery Plan (RP) by the SSLRT. After staff introductions and a review of the agenda, he asked Brock Bernstein, facilitator for the meeting, to continue.

NMFS Review of Plan and Team Status

Brix thanked the RT for its efforts to date, and described steps remaining in the planning process. After this meeting the National Marine Fisheries Service (NMFS) will make any necessary edits to the draft RP, publish it for public review, compile comments from that review, and make any necessary revisions. While there is no certainty of another RT meeting, NMFS does not plan to dissolve the RT until after the final RP is complete in case some of the public comments require additional RT consideration. When asked whether NMFS foresees a role for the RT after plan completion, Pultz observed that RT participation across NMFS is case-specific; some RTs are only responsible for writing while others also help during implementation. Capron noted that a SSL research plan has not been completed and asked RT members whether they were interested in some formal implementation role. He suggested that plan monitoring and oversight could be accomplished without additional public review and comment, while major changes to the plan must be reviewed.

Changes to the Draft RP since the Homer Meeting

Small reported that a subgroup consisting of Capron, Fritz, Gelatt, Pitcher, and Small had made most of the revisions since the August 2005 meeting in Homer. Several new introductory sections were added at the beginning, and Chapter III – Background - was extensively revised; population assessments for the Eastern and Western distinct population segments (EDPS and WDPS) were reported together in a single section. Since the Homer meeting produced contradictory suggestions for revising Chapter IV- Conservation Measures, the subgroup made few text revisions but removed a controversial table on historic fishery management actions, added a figure, and added an overview into the introductory section.

In Chapter V – Recovery Plan for the Western Population, the background sections on the WDPS were updated and revised for consistency, text on killer whales was added, and sections on prey biomass were reduced and moved to appendices. The threats assessment section was completely revised. Whereas the previous version looked at threats independently and concluded with a section that considered combined threats and the broader ecosystem, the revised assessment presents a series of scenarios that hypothesize ways in which SSL could be affected by threats. The threat assessment table was also reorganized. The basic elements of the recovery strategy for the WDPS were unchanged but presented differently. The subgroup (with the addition of Fraser) attempted to develop recovery criteria through work with Goodman on his population viability analysis (PVA). While that experience influenced their thinking on an

approach to recovery criteria, they ultimately decided to use a modified version of the criteria developed at the Homer meeting. Recovery actions were edited to reduce duplication, improve consistency, and more closely follow the format of the five listing factors.

Chapter VI – Recovery Plan for the Eastern Population – was streamlined, and all assessment information was moved to Chapter III. Most major elements were kept consistent with those in Chapter V, although the threat assessment was conducted differently due to the lack of threats. Most of the recovery actions were moved to the section describing the post-delisting monitoring plan.

Comments from Outside Reviewers

NMFS approached several individuals to act as outside reviewers; comments were provided by Ed Bangs (USFWS, Leader of the Northern Rocky Mountains gray wolf Reintroduction and Recovery Team), Don Bowen (Bedford Institute of Oceanography), Bob Hofman (former Scientific Program Director, Marine Mammal Commission), Terry Quinn (University of Alaska Fairbanks), Don Siniff (University of Minnesota), and NMFS SW Region staff. The reviewers generally characterized the draft document favorably and none recommended major revisions. Among their suggested changes were the following: (a) provide a definitive assessment for those threats ranked High/Low in the Threats Assessment; (b) describe how the 3% per year growth standard cited in WDPS Biological Recovery Criterion #1 will be calculated (e.g., 3-year running average); (c) provide a rationale for how recovery actions were prioritized. Some reviewers recommended that the RT provide its conceptual approach to recovery, and a more focused and comprehensive approach to recovery actions based on the background material on threats provided in the draft document. Others questioned why the RT made no attempt to assess the effectiveness of recovery measures listed in Chapter IV. Individual concerns included: (a) failure of the draft RP to address habitat issues, both the percentage occupied and the amount needed for recovery; (b) a lack of consistency between WDPS and EDPS recovery criteria; and (c) whether potential for overlap between WDPS and EDPS might affect treatment of the EDPS.

Identification and Discussion of Issues Raised by RT Members

RT members were each asked to identify their most pressing concerns with the draft RP and indicate whether these concerns could keep them from endorsing the document. Several members shared concerns raised by the independent reviewers, and several indicated that their concerns were substantial. All were generally complementary of the work done by the subgroup. The five most common concerns (not in order of importance) were:

1. Deal with the uncertainty inherent in threats ranked High/Low.
2. Develop delisting criteria for the WDPS.
3. Rethink priorities on recovery actions.
4. Discuss the basis for the 3% recovery criteria and decide whether criteria should be parallel for the WDPS and EDPS.
5. Decide whether the RT should comment on prior conservation measures listed in Chapter IV.

The RT agreed to discuss these issues separately in an attempt to achieve consensus. Other concerns raised by RT members included:

- Although there appears to be universal endorsement of an adaptive management experiment, it will be difficult to accomplish and may carry a high risk of failure.

- Several members questioned the value of scenarios in the Threats Assessment. They suggested that many other equally valid scenarios could be proposed.

- The 3% annual population growth rate observed for several decades in the EDPS and for recent years in the WDPS is lower than the maxima observed in other pinnipeds and phocids. This was troubling to some RT members who feared that there might be lingering threats that could be linked to fecundity.

- The executive summary contains some statements of unknown source and suggests conclusions that are unsupported. Members stressed that the summary should support the text and not editorialize.

- Although several PVA models exist or were commissioned by the SSLRT, only the Goodman model is discussed and included as an appendix. Some suggested equal treatment with a stronger discussion of other quantitative analyses. Others suggested that the Goodman PVA should be a separate citable document and not part of the RP.

- Some questioned the selection basis for the three appendices in the current draft RP. Some suggested that additional appendices could be added. Others suggested that any pertinent information from the current appendices should be included in the text.

- The draft RP omits discussions of food web issues, fishing at F_{40} and the prey remaining for SSL, and the distribution and magnitude of fisheries relative to recovery.

- The draft deals inconsistently with reproductive issues, pretending that hard data exist at some times but not at others.

- Indirect threats are ignored, particularly as they relate to nutritional stress. Signs of nutritional stress could also be evidence of contaminants or pollution.

- Some questioned the inclusion of a Russian sub-region within the WDPS. Available information consists of only one table and a half page of text, and there is no organized program of monitoring and research.

- The RT should agree on the standards for citable information. Conference abstracts should not be included at the level of other published works, and should at best be considered personal communications.

Discussion of High/Low Threat Rankings

The High/Low ranking was described as a bimodal response reflecting disparate assessments from team members, based on available information and associated uncertainty. Some suggested that the RT needs to strengthen the explanation of why SSL might be particularly vulnerable to threats the team has labeled High/Low. SSL have shorter foraging trips relative to other otariids and a longer dependency period after birth. While most Endangered Species are subjected to identifiable threats, they suggested that threats to SSL must be viewed in broader ecological terms. The ecosystem of the WDPS is showing signs of strain, as evidenced by trends in sea

otters and other species. Unpredictable events have been seen in the past and should be expected in the future. They encouraged the RT to embrace the inherent uncertainty and use it to focus and prioritize future research.

Other members objected to a ranking of Uncertain, noting that the table already contains a column to rank the relative uncertainty of the available information. They feared that an Uncertain ranking would provide little support for action or funding. From a precautionary perspective, they suggested that the High/Low ranking should be changed to Potentially High. Some RT members were unclear whether the threat rankings (whether High, Low, or Potentially High) with respect to fisheries were based on current management strategies or those of 10 years ago. Since the recent NMFS Biological Opinion concluded with a finding of No Jeopardy, they suggested that groundfish fisheries as currently managed are a Low threat. Similarly, they were uncertain whether the consequences of a High or Potentially High ranking were more restrictions or more research. Others countered that the presumption of high potential risk drives many current management actions and the emphasis on adaptive management. They faulted NMFS for a failure to adequately assess the efficacy of its management actions, and noted that no other identified threats have the same high feasibility of mitigation. They suggested that fisheries be viewed more generically than the groundfish fisheries governed by Fishery Management Plans (FMPs), since other non-FMP fisheries harvest prey important to SSL.

RT members suggested the ranking Potentially High as a compromise to reflect both the bimodal uncertainty and the precautionary approach to these threats. A proposal to (a) use this label in all titles and tables; (b) make fisheries references more generic by removing references to groundfish; (c) emphasize in text the bimodal evaluations of these threats; and (d) link this ranking to the importance of testing the efficacy of management measures was approved by the RT (11 favored, 1 opposed, 1 abstained). The member in opposition supported the concept of high uncertainty but not high potential.

A subgroup consisting of Behnken and Wynne, with assistance from Capron and Pultz, was charged with drafting substitute language; their substitute was reviewed by the RT on 17 March and accepted with the following changes. The subgroup clarified that the ranking of Potentially High refers to the nature of the threat and not to its frequency of occurrence. Some RT members were concerned that the Potentially High ranking could be construed as a judgment on current mitigation measures in FMP groundfish fisheries. Subgroup members noted that the specific reference to "groundfish" had been stricken from the text, and that their focus had been on all fisheries including those without mitigation measures. They agreed to add clarifying language to that effect. Some suggested that the discussion on p. 107 [83][1] might be an appropriate place to emphasize the focus on all fisheries.

Discussion of Conservation Measure Efficacy

The comments of Hofman observed that there appear to be substantially different views on the cause of the SSL decline. The efficacy of past management actions is important, so the RT needs to describe the measures taken and levels of compliance, and suggest remedies if

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[1] Both page numbers refer to the 17 Feb 2006 draft RP. The first number refers to the page in the version of the document distributed with figures/tables from Chapter III; the number in brackets refers to the page in the version distributed without figures/tables.

necessary. RT members suggested that efficacy could be measured based on whether management actions: (1) spatially and temporally distributed the fishery; or (2) were beneficial to SSL. Some members believed that only the first of these standards could be evaluated at this time, and used catch in Critical Habitat as a measure of success. They maintained that catch in Critical Habitat has not declined in recent years, and were reluctant to endorse existing measures as suggested in the Recovery Strategy V.B.2.1 (p. 115 [91]). Others maintained that redistribution of fisheries was already the subject of the 2003 NMFS Biological Opinion (BiOp), NMFS is currently re-initiating consultation on management measures, catch in Critical Habitat may not be the best measure of efficacy, and the RT was being asked to second-guess the agency and its management plan. Some members suggested that to the extent management actions had reduced harvest within 10 nmi of rookeries and haulouts they were likely beneficial, as these areas are known to be important to foraging female and juvenile SSL. Some suggested that substituting language from task 2.6.6 of the stepdown outline (p. 156 [131]) as the Recovery Strategy would more accurately reflect RT intent; i.e., evaluate and implement appropriate fishery regulations to protect foraging habitat and prey resources for sea lions. They also suggested that bridging language was necessary in Chapter IV to give a reader a sense of the essential elements needed to evaluate fishery management measures, and give notice that additional evaluation is recommended. Members generally wished to ensure that future analyses of FMP and non-FMP fisheries be conducted at temporal and spatial scales appropriate to SSL. A motion to add this bridging language was approved (15 favored, 1 opposed).

Discussion of Recovery Criteria

WDPS Biological Recovery Criterion #1

Subgroup members explained that the 3% population trend was chosen as a likely scenario given the EDPS increase for several decades and the recent increase of 2.8% per year in the WDPS. The PVA analysis was used to project how long an increase of that magnitude would be necessary. Subgroup members confirmed that they intended to specify an average growth rate of 3% over 15 years; annual fluctuations in the rate are unimportant if the 15-year average is 3%. There was general consensus that this language must be clarified. Some members were interested in the range of variability (including periods of negative growth) that might be acceptable. They suggested that error statistics be used to specify the precision desired. Alternatively, some suggested the criterion specify that no more than two consecutive surveys be declining. Others suggested a running average of the three most recent surveys, recognizing that this spans a period of six years since surveys are conducted biennially.

RT members discussed whether their true goal should be a target population size needed to fill available habitat. Such a goal is more readily understood by the public, even though specifying a growth rate over a period of time from a designated starting point produces a similar result. Some believed a numeric goal might allow NMFS to downlist the WDPS sooner if the population expands more rapidly than expected. Numeric goals are also consistent with IUCN classifications that consider the rate of decline, distribution, and the size of a population. Others suggested that the importance of time should not be discounted, since it relates both to the generation time of SSL and to the length of environmental regimes. Including the element of time ensures that any observed population increase is robust and long-term based on the likelihood of regime shifts.

Capron suggested that many scenarios involving future rates of increase are possible, and the RT should describe only those most likely. NMFS will deal with other contingencies as they develop and with adequate justification could downlist earlier if the population outperforms expectations. He urged RT members not to bind the agency with complicated restrictions, recommending that the onus be placed on NMFS to explain how it meets general delisting criteria. The agency needs a strong reason to deviate from a RP, and it must still address all concerns raised by the plan.

Initially the RT was evenly divided over whether to (a) specify a mean growth rate over time; or (b) pursue a hybrid approach that includes a recovery rate over time and a target population size that would allow NMFS to downlist sooner (8 in favor of each proposal). After further discussion, two members were persuaded that the element of time was more critical than population size and agreed to support the first option.

Some questioned the similarity between the proposed downlisting criteria for the WDPS and the observed conditions used to justify delisting the EDPS; growth rates of approximately 3% per year are used for both. Some saw this similarity as evidence that the EDPS delisting criteria are not stringent enough. Others argued that since the protections of the Endangered Species Act (ESA) are still in effect after downlisting to Threatened status, criteria for downlisting should be less stringent. Some suggested that any statistically significant population increase over a 15-year period should be adequate to demonstrate that extinction is not eminent, while others argued that even stability over an extended period should be sufficient. Members discussed whether the precision (or the lack thereof) in survey estimates makes the 3% standard any different from a non-specific statistically significant increase. While some disagreed that the agency could not distinguish between an increase of 3% and zero with current data, others feared that specifying any low numeric percentage might imply the need for greater precision and more data/time/funding. Based on this rationale, the RT initially agreed to use any statistically significant increase over time (13 favored) rather than an average annual increase of 3% over time (3 favored).

Some members asked that the RT reconsider this decision the next day. Recognizing earlier RT concerns, they noted that the RT has identified predation, oceanographic variability, and fisheries as three threats with potentially high impacts on SSL recovery. They argued that a biological criterion of non-negative growth does not reflect reduction of those threats, as it could permit the population to virtually stabilize without further growth. The Goodman PVA demonstrates that causes of the severe SSL decline are not fully understood. The PVA cannot fully account for mortality associated with that decline and indicates a more precautionary criterion is warranted. The non-negative growth criterion is arguably inconsistent with a population being out of danger of extinction, and they urged restoration of a biological criterion of 3% average annual growth rate over 15 years based on the rationale in the current draft plan. Several members expressed support for a criterion that requires more than minimal growth. Some again suggested including confidence bounds or measures of variability, but were cautioned by Capron that their attempts to provide flexibility might actually make the criteria more restrictive. On reconsideration, 10 still favored the standard of a standard of a statistically significant increase over 15 years and six favored the 3% average annual growth rate over 15 years.

The RT also discussed a proposal to use Recovery Criterion #1 as a delisting criterion for the WDPS rather than as a downlisting criterion. The WDPS could currently be considered Threatened because the estimated size of the WDPS is large compared to most endangered species, its recent population trend is positive, the principal threat related to human activity (i.e., commercial fishing) has been addressed through ongoing regulatory measures, and data on population size and trend data are good compared to those for many endangered species and are collected on a timely and frequent basis. The ESA provides no specific standards for recovery criteria, providing flexibility for lower standards in situations where data are good and there are opportunities for frequent re-evaluation of population status and trend. Rookery-specific PVA models suggest that while some rookeries may still be in jeopardy, survival of the WDPS as a whole remains highly likely. Members of the PVA subgroup noted they were unwilling to accept some of the assumptions of the rookery-specific model, particularly the assumptions that density dependent factors would play a significant role in future WDPS trends and that the decline during the mid-1980s represents a catastrophe that is unlikely to ever reoccur. Subgroup assumptions, as reflected in the Goodman PVA model, suggest a more conservative approach. Some members were skeptical that additional fishery restrictions could be implemented quickly in response to a rapid population decline. Others suggested they were unwilling to recommend downlisting at this time since so little is known about the cause(s) of earlier declines; a longer period of stability or population increase would give those members more confidence. The proposal to use the 3% average annual growth rate over 15 years as a delisting standard was rejected (0 favored, 15 opposed, 1 abstained).

WDPS Biological Recovery Criterion #3

The Russian/Asian component is included as a sub-region in this criterion, and some RT members questioned its inclusion. They noted that contrary to ESA guidelines, participants from this area have not been involved in the process. Data from the region are inconsistent with that collected throughout the rest of the SSL range. If declines in the region are anticipated and are outside the scope of U.S. influence, the requirement that no two adjacent sub-regions be in decline bases the fate of the WDPS on the status of the adjacent Western Aleutian Islands sub-region. Some argued that the RT must consider the species everywhere it exists and cannot ignore Russia. Others maintained that the characterization of current work in Russia is incorrect and the status of the stock is not as grim as has been portrayed. NMFS and the Alaska Sea Life Center fund much of the work, and while some areas are in decline the overall trend for the sub-region is stable. Some members noted that a genetic basis has been suggested for listing the Russian stock as a separate DPS, but they were cautioned that such a status review is beyond the scope of the current effort of this recovery team.

This criterion also requires that non-pup count trends and other available information in a majority of the regions be "consistent with" the trends specified in Criterion #1. RT members questioned whether "consistency" means the trends in each sub-region must also increase at that rate. There was consensus that the majority of sub-regions specified in Criterion #3 could show either a stable or increasing trend. The rate specified in Criterion #1 applies only to overall trends for the WDPS.

The RT rejected a proposal to modify Criterion #3 to require that four of seven sub-regions be stable or increasing, with no three adjacent sub-regions in decline (1 favored). They retained the existing standard that five of seven sub-regions be stable or increasing, with no two adjacent sub-regions in decline (15 favored). Those who opposed the proposal suggested that the lack of data made any detectable decline in the Russian sub-region of significance, but they agreed that an absence of data should not necessarily be interpreted as an indication of decline. Those who questioned whether it was inconsistent to exclude the Russian component in Criterion #1 while including it in Criterion #3 were reassured by Capron that it was not logically inconsistent because Criterion #3 addresses issues related to persistence in "a significant portion" of the range.

WDPS Listing Factors

The RT approved a series of word/line edits to the draft listing factors (see Appendix A), including a list of changes regarding direct threats proposed and distributed by Atkinson. All changes were adopted by unanimous consent.

WDPS Delisting Criteria

Subgroup members noted that they proposed no delisting criteria because they believed a better understanding of existing threats is required before attempting that exercise. NMFS staff cautioned that delisting criteria may be difficult to develop but not impossible. With only rare exceptions, ESA standards as enforced by the courts require objective and measurable delisting standards. The RT discussed several options but soon realized that two different definitions of "generation" were being used. Chapter V for the WDPS defines a generation as the mean age of reproducing females (i.e., 10 years), while Chapter VI for the EDPS defines a generation as the average age of first reproduction (i.e., 6 years). While neither definition is wrong, the RT decided that the WDPS definition is most commonly used and agreed (15 favored, 0 opposed, 1 abstained) to define generation time for both the WDPS and EDPS as the mean age of reproducing females.

The RT first considered extending its Biological Recovery Criterion #1 for an additional 15 years as a delisting standard, but some feared that standard could be met by a 30-year (3-generation) period of little more than stability. Most members wanted some assurance that threats had been addressed before delisting, and favored a period of measurable growth. An average annual growth rate of 3% would more than double the population size in three generations (30 years) and, if started in the year 2000, would restore the WDPS population to levels comparable to those of the early 1980s. Most members (10) favored that approach rather than a shorter period of more rapid growth (5% average annual growth for two generations: 6 favored).

The RT discussed how to reconcile the PVA with its delisting recommendation. PVA subgroup members noted that model results are highly dependent on assumptions, and some RT members believed that the primary value of modeling was the critical review of those assumptions. There was consensus that the RP should describe the use of PVA models as tools that contributed to discussion and the development of recovery criteria. The results these tools provide depends on the assumptions they make, and ultimately the RT decided to be advised but not guided by any of

the models. There was an extended discussion over inclusion of the Goodman PVA as an appendix to the RP. Those opposed to its inclusion in the RP maintained that the Goodman PVA constitutes original research that is more appropriate for a stand-alone document, and they cited inequitable treatment of other PVA models. Those who favored including the Goodman PVA expressed greater acceptance of the assumptions in that model, particularly its refusal to consider the decline of the mid-1980s a catastrophe that will not reoccur. Although they preferred to present the model as a report from Goodman to the RT, they cited the active participation of RT subgroup members in its development. Others were concerned about the availability of the report to the public should it appear as a stand-alone document. In a first vote, a small majority favored including the Goodman PVA as an appendix (8 favored, 7 opposed, 1 abstained), but after additional discussion a larger majority favored its inclusion (11 favored, 5 opposed). Trites agreed to provide an expanded discussion of alternative PVA models for inclusion at p. 31-32.[2] Any interested RT members were asked to examine the PVA text in Appendix 3 and to provide Small with suggested material for an expanded preamble to reflect the RT consensus view on the utility of PVA modeling.

Presuming that Delisting Criterion #1 would specify an average annual growth rate of 3% over three generations, the RT considered what other biological criteria should be included. Most members appeared to favor repeating Biological Recovery Criterion #2; i.e., population ecology and vital rates in U.S. regions consistent with the trend in #1. Discussion focused on how to incorporate range concepts contained in Biological Recovery Criterion #3. Some members favored the "stable or increasing" description rather than "consistent with" to make clear that not all areas would be required to achieve the 3% annual rate of growth. Others were concerned that explosive growth in a single area could mask a lack of progress throughout the remainder of the range. To make the criteria more stringent, they suggested increasing the requirement for stable or increasing regions to six of seven, or to require that five of seven regions be increasing (and not stable) with no two adjacent regions in decline. Some members were concerned that this focus on regions ignored the fate of small rookeries (e.g., those on the Pribilof Islands) and risked a potential loss of genetic diversity. Other members noted that the RP stepdown outline requests a NMFS review of population structure and suggested that RT concerns for additional information on small populations like those on the Pribilofs could be highlighted there.

After a preliminary vote and additional discussion, attention focused on two options: (a) five of seven regions stable or increasing, no two adjacent regions in decline, and (b) five of seven regions increasing, no two adjacent regions in decline. Inherent in both these options is the potential that two regions could decline, so the RT considered the degree of decline that would be acceptable. Some suggested that any declines must of necessity be small due to the prior requirement that the overall population increase by 3% annually. Others cited modeling results that suggest the small SSL population in the Western Aleutian Islands region is unlikely to persist, but maintained that would still be acceptable if there was substantial recovery throughout the rest of the range. They noted that few endangered species occupy their historic range, and suggested that SSL would not have been listed if the original decline had been limited to the

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[2] The Trites revised language was distributed and reviewed by the RT on 17 March. Some members noted that differences in approach and assumptions (e.g., how the models deal with density dependence) were not clear. Some of those details were not apparent in the description of the Goodman model (Appendix 3), so Small agreed to provide a brief overview.

Western Aleutians. They also observed that two of the three identified threats are beyond human control. A preliminary vote suggested that many members still preferred criteria that maintain all regions at some viable level (7 favored) over criteria that allow loss of a portion of the range (3 favored, 6 abstained). Those who favored maintenance of all regions were troubled because the cause of the decline in the WDPS is largely unknown. They recognized that the environment is always changing, animals adapt, and ranges shift, but were uncomfortable recommending the delisting of a species whose range could be contracting.

To address concerns regarding regional extirpation directly, the RT considered options for just those regions in decline. RT members were indecisive about an option that would allow (a) only one of those regions to decline by more than 20%, versus (b) none to decline by more than 20% (6 favored each option, 4 abstained). A suggestion to change the percentage to 50%, making it more comparable to the IUCN category for extinction, produced a more conclusive result. Ten members favored an option that would allow no region to decline by more than 50%, four members favored the alternative, and two abstained. Once regional extirpation issues were addressed, several members noted little functional difference between the remaining delisting criterion options. The RT adopted revised option (a) for WDPS Delisting Criterion #3: five of seven regions stable or increasing, no two adjacent regions in decline, and none by more than 50% (9 favored, 5 preferred revised option (b), and 2 abstained).

Little time was spent discussing WDPS Delisting threats criteria. Some RT members seemed to believe that most of the existing downlisting threats criteria, with the exception of references to Critical Habitat and Section 7 consultations, could become delisting criteria if all references to "not likely to limit recovery" were changed to "not likely to recur". A subgroup consisting of Byrd and Behnken was asked to prepare draft language. Their proposal was distributed to the RT, reviewed, and accepted with minor changes on 17 March.

EDPS Biological Criteria

Small reported that there had been few changes to this section since the draft distributed at the Homer meeting. RT members noted that their earlier decision to standardize generation length did not affect the logic already used in this section. The 3% annual increase in population size is still demonstrable over three generations under the new definition.

One RT member was concerned that the RP focuses on the EDPS as a whole, to the detriment of animals at the southernmost end of the range. That population was characterized as small and fragile, and the member suggested a regional approach similar to that used for the WDPS. Pitcher reported that SSL at what are currently the two southernmost sites (Año Nuevo and Farallon Islands) declined during the 1970s-1990s but have been relatively stable since that time. Breeding populations on the Channel Islands began declining during the early 1900s and were gone by the 1980s; that area has since been subjected to human development and colonization by California sea lions. RT members noted that delisting under the ESA would not remove existing protections provided under the MMPA, and that SSL populations in California are monitored more frequently (annually) than elsewhere in the range. Pultz suggested that it might be possible to extend the period of post-delisting monitoring to a generation rather than the traditional five years. The RT discussed several options for where regional boundaries might be drawn. Several

members objected to this approach, suggesting that the southernmost animals were at the fringe of the species' range and might simply be meeting their physiological limits. They did not view southern California as a significant portion of the SSL range and were reluctant to create subdivisions in the EDPS at this late stage in the process. Others objected to arbitrary subdivisions and could support a regional approach only if there was some biological basis, although some noted that there was no biological basis for regions in the WDPS. Gelatt reviewed available literature and reported that Ono examined 11 animals from Año Nuevo and detected only haplotypes that were found in other parts of the EDPS, while Bickham reported detection of one haplotype that is uncommon in the EDPS but is found in Russia. Small reviewed the records from previous RT meetings and could find no reference to unique haplotypes in the southern California SSL population. The RT decided against creating sub-regions in the EDPS at this time, leaving it to the post-delisting monitoring plan to evaluate the utility of a regional approach (14 favored, 1 opposed, 1 abstained).

During the discussion, some RT members noted that killer whales and environmental variability do not appear to present the same threat to the EDPS as they do to the WDPS. They suggested that the Threats Assessment (p. 168 [144]) be expanded to discuss this difference; Trites agreed to provide additional language.

Evidence for Declining Fecundity in the Central Gulf of Alaska
Elizabeth Holmes, NMFS Northwest Fisheries Science Center

Holmes is updating a 1998 study with data to 2004 in an effort to understand the sensitivity of the earlier analysis. The study focuses on the Central Gulf of Alaska (CGOA) since life history data are available there. She examined SSL survivorship and fecundity during five periods from the 1970s through the present using age structure metrics (fraction of juveniles on haulouts, total non-pups on haulouts, total CGOA pup count) from trend count sites. Basic life history was estimated from 1970s age and pregnancy data from Marmot Island to obtain survivorship (age i to i+1) and pups per female. Using a matrix model, parameters in each of the five time periods were allowed to vary by three scaling factors. The model was run and compared to the data to the combinations that best fit the data. The best model fit occurs under conditions of steadily declining fecundity from the mid-1980s through 2004, with steadily increasing adult and juvenile survivorship. Three other models (Calkins & Pitcher 1982, York 1984, and Holmes et al. 2006) were fit to the age and pregnancy data with varying degrees of success. Of these, Holmes et al. 2006 fit the life history data best while Calkins & Pitcher 1982 fit poorest. All models explain the data with declining fecundity and increasing juvenile survivorship. One reason why all models agree is that pup to non-pup ratios have been declining steadily throughout the period. Model predictions are generally consistent with data from the 2004 medium format photographic survey. It is difficult to explain the overall CGOA data since 1980 without a drastic decline in SSL fecundity, unless one presumes that sighting efficiency has increased by at least 50% during this period.

RT questions and discussion:

- When asked whether something else could be killing pups, Holmes acknowledged that the definition of fecundity uses pups at the age they are censused, so they could be killed

by something else during their first weeks of life. Fritz noted that the percentage of dead pups at the time of census has not increased over time. If another factor is at work, it should also be evidenced by a decline in juvenile survival. He noted that for increased sighting to be a factor it would need to occur throughout the CGOA.

- RT members asked how lag effects (increased survivorship of non-pups that are not producing pups yet) could affect the results. Holmes replied that one feature of the model is its ability to integrate such gaps, and it cannot explain the data using changes in age structure alone.

- The percentage of adult SSL males in the population seems to have increased, so RT members questioned how a change in the adult sex ratio (a higher percentage of non-pups being male) would affect the model. Holmes noted that the model assumes a constant sex ratio, and that issue cannot be addressed with existing data. An estimate of sex ratios could be obtained from medium format photography and compared with earlier estimates, but the model without a changing sex ratio still fits the data quite well. Fritz noted that a changing sex ratio as described would still translate into a decline in the overall population fecundity.

- When asked whether her life history changes had been compared with those used in Winship & Trites 2006, Holmes replied that she had made no specific comparison but felt the two were not completely inconsistent.

Discussion of Other Issues

Indirect Threats

Atkinson proposed a series of editorial changes associated with indirect impacts of contaminants and disease. These were generally accepted without discussion and are included in Appendix A.

Some members objected strongly to the discussion of direct/indirect threats on pp. 99-100 [75-76], recommending that most of p. 99 and some of p. 100 be deleted. They were uncomfortable with the level of certainty in the statements, believed that some were not completely thought through, and believed the logic was at times faulty. They maintained that some of the statements on p. 99 were not supported by the rest of the document. They suggested that deleting this material would not affect the remaining document. Others suggested that the direct/indirect discussion made more sense when viewed in terms of "top-down/bottom-up"; they suggested deleting p.99 and inserting the "top-down/bottom-up" sections from pp.108-109 [84-85]. A subgroup of Wynne, Atkinson, and Fritz were asked to investigate the necessary changes and explain them to the RT.

Use of Scenarios

Some RT members believed the scenarios should be removed; their principal concern was that the scenarios represent only a fraction of the possible explanations for the decline of SSL. After some discussion, RT members agreed that the scenarios could remain if they are preceded by a sentence explaining that the scenarios represent examples and are in no way an exhaustive list. Some members were concerned that the use of some citations in the scenarios made them appear

to be scientific arguments; RT members agreed that the scenarios were stories and should contain no citations.

Environmental Variability

A RT member questioned a statement in the threat evaluation for Environmental Variability (p. 106 [82], ¶2, last sentence) that seemed to imply influences from the 1976-77 regime shift have persisted through to the present time. After some discussion, RT members agreed that their intent was that the potential for this type of environmental impact persists, not that there are lingering effects from a particular event.

General Editorial Comments

Trites submitted a list of editorial suggestions to the Executive Summary and elsewhere in the document that addressed statements he viewed as misleading. The RT accepted some, modified some, and rejected others. Those accepted or modified have been included in Appendix A. Several suggested changes were referred to subgroups for resolution (¶ 3, p. 8 [8], sentence 1 – Trites, Gelatt, Wynne; ¶ 1, p. 88 [64] , pp.212-213 [188-189] – Trites and Atkinson). RT members generally agreed that the use of weighted words (e.g., indeed, facilitating, etc.) should be avoided whenever possible.

Atkinson submitted a proposal for a new Priority 1 recovery task that would institute a "fast track" process for expediting NMFS OPR research permits for SSL. The proposal was adopted with no objection.

Some RT members suggested that conference abstracts should not be included at the level of other published works, and should at best be considered personal communications. Most members agreed. Since the RT had already agreed to avoid references to personal communications, existing references to conference abstracts will also be removed.

One member distributed and encouraged the RT to adopt formal direction to NMFS that recognized the uncertainties surrounding the identified threats to SSL. It instructed NMFS to remove any language from the final draft that seemed to suggest one hypothesis had gained credence over another, and insure descriptions are objective and the tone is credible and professional. All agreed that the use of superlatives and subjective statements should be avoided. Several RT members agreed with the direction of the statement, expressing concern that requested changes to the document might be ignored. Small suggested that members must trust the subgroup to make the necessary changes. After some discussion, the RT agreed that Wynne should be added to the subgroup as a final reader to review the document for objectivity. Specific examples cited during the subsequent discussion included:

- pp. 106-107 [82-83] – implies a causal link between fishery removals, SSL prey quality/quantity, and reduced SSL survival and reproduction. Suggested solution: present as a hypothesis and qualify the relationship with "may"

- ¶ 3, p. 109 [85] – implies that large-scale fisheries began in the 1960s and ignores the prior existence of foreign fisheries, whaling, domestic salmon fisheries, etc. Suggested solution: acknowledge the full range of fishing activities; replace the word "unprecedented".

- pp. 71-72 [47-48] – Biomass fishing charts should include catch 0-10 miles as discussed in earlier RT meetings.

- ¶ 2, p. 89 [65] – In earlier meetings the RT suggested it would not reevaluate telemetry data; the last sentence implies that the RT did precisely that. Suggested solution: Small recalled a comment from Hofman addressing that issue and will redraft.

Adaptive Management

The RT discussed the priority placed on design and implementation of an adaptive management experiment (p. 115 [91]). Some members hoped the RT would strongly endorse an adaptive management experiment without ranking it Priority 1 as in the current draft. The proposal has widespread industry support in principal but has never been realized because earlier experimental designs: (a) were judged in violation of the no-jeopardy standard, or (b) were so large in scale they would close most fisheries. They suggested that conducting the experiment was not a step that must be taken to prevent extinction (Priority 1), and neither was it something that must be done to prevent significant declines in species population, etc. (Priority 2). If a practical and affordable experimental design is never developed, they feared that failure to perform a Priority 1 task could preclude downlisting or delisting the species. NMFS representatives noted that Priority 1 tasks also rank highly in agency funding priorities. Although NMFS must address its efforts to accomplish all prioritized tasks during a downlisting/delisting, completion of all tasks is not legally binding. They suggested that more piecemeal experiments may be feasible where global experiments are not. The RT agreed to retain the Priority 1 ranking for the adaptive management experiment (9 favored), versus a Priority 2 (3 favored) or Priority 3 (0 favored) ranking. RT members did agree to include language in this section acknowledging the difficulties associated with an adaptive management experiment (e.g.: However, it is recognized that there have been difficulties developing large scale experimental fishery designs that meet the jeopardy standard and provide reasonable fishing opportunities.).

Conclusion

Small asked RT members for consensus endorsement of the draft RP based on their understanding of the final editing that will take place. Only one member expressed reservations based on concerns for the EDPS, but that member also agreed to endorse the document. Small thanked the RT for its support, and RT members thanked both Small and Capron for their efforts. NMFS staff complemented the RT on the quality of the document, and the meeting adjourned at approximately 13:00 on 17 March.

Table 1. Attendance at all or portions of the Steller Sea Lion Recovery Team meeting held 15-17 March 2006 at the Alaska Fisheries Science Center, Seattle, Washington.

*	Shannon Atkinson	Alaska Sea Life Center & University of Alaska, Fairbanks
*	Linda Behnken	Alaska Longline Fishermen's Association
‡	Brock Bernstein	
	Kaja Brix	National Marine Fisheries Service, OPR
*	Vernon Byrd	U.S. Fish & Wildlife Service
	Shane Capron	National Marine Fisheries Service, OPR
†	Al Didier	
*	Dave Fraser	F/V Muir Milach
*	Lowell Fritz	National Marine Fisheries Service
*	Tom Gelatt	National Marine Fisheries Service
*	Dave Hanson	Pacific States Marine Fisheries Commission
*	Lianna Jack	Alaska Sea Otter and Steller Sea Lion Commission
	John LePore	National Marine Fisheries Service
	Terry Leitzel	North Pacific Fishery Management Council
~	Denby Lloyd	Alaska Department of Fish and Game
	Tom Loughlin	
*	Donna Parker	F/V Arctic Storm
*	Ken Pitcher	Alaska Department of Fish and Game
	Susan Pultz	National Marine Fisheries Service, OPR
**	Bob Small	Alaska Department of Fish and Game
*	Alan Springer	University of Alaska, Fairbanks
*	Ken Stump	
*	Andrew Trites	University of British Columbia & North Pacific Universities Marine Mammal Research Consortium
*	Terrie Williams	University of California, Santa Cruz
	Bill Wilson	North Pacific Fishery Management Council
*	Kate Wynne	University of Alaska, Fairbanks

*	Steller Sea Lion Recovery Team Member
~	Steller Sea Lion Recovery Team Member, absent
**	Chair, Steller Sea Lion Recovery Team
†	Rapporteur
‡	Facilitator

STELLER SEA LION RECOVERY TEAM MEETING

15-17 March 2006
Traynor Room, Alaska Fisheries Science Center
Seattle, Washington
Draft Agenda

<u>**Wednesday, 15 March**</u>

<u>8:00 am</u>
1. Review and approval of agenda

2. Comments from NMFS
   - Where we are in the recovery planning process
   - What are the next steps for the Recovery Plan
   - What is the future of the SSL Recovery Team

3. Present and discuss meeting overview
   Goal of Meeting: Complete revisions necessary for endorsement of the Recovery Plan by the Recovery Team.

4. Overview of suggested revisions received prior to meeting, from Recovery Team members and outside reviewers

5. Overview of substantive revisions to the Recovery Plan since last meeting in Homer

6. Identify priority issues/sections that may need revision, and schedule available meeting time to achieve Meeting Goal

7. Make final revisions to Recovery Plan
   - Discuss suggested revision
   - Decide if revision will be made
   - Make revision

<u>**Thursday, 16 March**</u>

8. Make final revisions to Recovery Plan, continued

<u>**Friday, 17 March**</u>

9. Make final revisions to Recovery Plan, continued

10. Recovery Team endorsement of Recovery Plan

11. Adjourn (~Noon)

Appendix A

This appendix contains changes to specific lines in the Draft Recovery Plan for the Steller Sea Lion – draft of 17 February 2006 – approved during the 15-17 March 2006 meeting, in addition to paragraph-level edits and redrafts that were distributed and reviewed. Throughout this summary, paragraphs are numbered starting from the first complete paragraph at the top of the page. Initial page numbers refer to the page number in the full draft distributed with tables and figures in Chapter III. Page numbers in brackets refer to the page number in version distributed without tables and figures.

¶ 2, p. 8 [8] – … There is ~~strong~~ some evidence that indicates animals in this population …

¶ 2, p. 8 [8] – … Therefore, it is ~~likely~~ possible that several factors were important in driving the population decline during this time period.

¶ 3, p. 8 [8] – … ~~During this decade, the animals no longer appeared to be as nutritionally stressed as they had in the 1980s.~~ The primary factors associated with the decline during this period have not been ~~reliably~~ identified. …

¶ 1, p. 9 [9] – ~~It is plausible that the c~~ Conservation measures implemented since 1990 ~~are indeed facilitating~~ may have facilitated the recovery of the western DPS. ~~There appears to be a positive correlation between the implementation of conservation measures in the late 1990s and early 2000s and stabilization or recovery in the western DPS.~~ It is also possible that recovery can be attributed to other factors such as environmental variation or reduced predation. However, it is too early to conclude whether the recent apparent leveling off ~~is real~~ will continue or is necessarily due to the conservation measures implemented.

¶ 1, p. 12 [12] – Insert as second to last sentence: Knowledge of the impacts of toxins on sea lion growth and reproduction as well as the maintenance of overall health is sufficient to conclude that it is not limiting the recovery of SSL populations.

Top of page, 40 [40] – … actions taken to reduce intentional take have been ~~very~~ effective, it is ~~impossible to determine~~ unknown whether fishery conservation measures have been effective in reducing threats to Steller sea lions. Since 2000 the western population has increased in numbers and may be the beginning of a recovery. ~~At this point, we can only say that t~~ The increasing trend is correlated with ~~actions taken to reduce the competition between fisheries and sea lions~~ fishery conservation measures taken since the 1990s, but it is not known whether the relationship is causal.

¶ 2, p. 68 [44] – Steller sea lions prey upon some fish species that are also harvested by commercial, subsistence, and recreational fisheries (e.g. pollock, Pacific cod, Atka mackerel, salmon, and herring). Fishery rRemovals ~~by human harvesters~~ have the potential …

¶ 3, p. 68 [44] – … implemented by NMFS may have indirectly contributed to Steller sea lion conservation …

¶ 2, p. 73 [49] – In the North Pacific Ocean three "ecotypes" of killer whales have been recognized by their genetics, morphology, acoustics, association patterns, and feeding ecology,

including their prey (Bigg et al. 1987, Ford et al. 1998; Ford et al 2000, Ford and Ellis 1999, Barrett-Lennard 2000, Hoelzel et al. 1998, Saulitus et al. 2000). Differences in ~~the home range size and~~ movement patterns among killer whale ecotypes have led, in part, to their names; i.e., "resident", "transient", and "offshore". ~~Specifically, residents have the smallest home range and typically return each year to predictable locations, transients have larger home ranges and have less predictable movements as they transit through local areas quickly, whereas offshores have the largest home ranges that include areas farther offshore.~~

¶ 1, p. 96 [72] –
The possible impacts of various types of disturbance on Steller sea lions have not been well studied, yet the response by sea lions to disturbance will likely depend on season, and their stage in the reproductive cycle <u>(Kucey and Trites 2006)</u>. Close approach by humans, boats, or aircraft will cause hauled out sea lions to go into the water, and <u>can cause some animals to move to other haulouts. T</u>~~t~~he discharge of firearms …… resulting in stampedes that may cause trampling or abandonment of pups (Calkins and Pitcher 1982; Lewis 1987<u>, Kucey 2005</u>). In British …

¶ 1, p. 99 [75] – …and also operate indirectly by affecting <u>sea lion physiology,</u> condition and reproductive rates.

¶ 4, p. 99 [75] – Indirect threats, add bullets:
- <u>Toxins</u>
- <u>Disease</u>

¶ 1, p. 104 [80] – … ~~However, there are no studies on the effects of toxic substances at the population level to determine their impact on vital rates and population trends.~~ <u>Newer toxins such as PBDEs have not been measured in SSL.</u> …

¶ 1, p. 116 [92] – Insert after second sentence: Further, the need to understand the mechanism of possible nutritional stress, the indirect impact of contaminants on vital rates, and the possible impact of disease is important to managing the threats to SSL.

¶ 4, p. 119-120 [95-96] – Factor B.1: Incidental takes are limited in commercial <u>and recreational</u> fisheries…

¶ 1, p. 120 [96] – Factor C.1: ~~Methods have been developed and utilized to test sea lions for health related illness that may be limiting recovery and that i~~ <u>I</u>nformation is adequate to conclude that disease is not <u>likely</u> limiting recovery.

¶ 1, p. 120 [96] – Factor C.2: …predation is not <u>likely</u> limiting recovery.

¶ 3, p. 120 [96] – Factor E, insert after first sentence: It is important to acknowledge that any indirect effects of toxins are currently unknown for SSL.

¶ 1, p. 120 [96] – Factor E.1: …harvest levels do not <u>likely</u> limit sea lion recovery.

¶ 3, p. 120 [96] – Factor E.2: Sources of <u>known</u> pollution, including …

¶ 2, p. 175 [151] – bullet 5: Monitor <u>the magnitude and distribution of commercial and recreational</u> fisheries to ensure the protection…

¶ 3, p. 124 [100] – 4.2.3. … contaminant-linked endocrine effects, including free-ranging and captive work.

¶ 3, p. 124 [100] – 4.2.4. ~~Modeling contaminant impact and effect.~~ Develop models to simulate contaminant impacts and effects based on energetics, physiology, abundance and demographics.